ANTIBIOTICS SELF-MEDICATION AMONG DENTAL PATIENTS FROM LITHUANIAN UNIVERSITY OF HEALTH SCIENCES MEDICAL ACADEMY FACULTY OF ODONTOLOGY DEPARTMENT OF PROSTHODONTICS

Master’s Thesis

Kaunas, 2019
ANTIBIOTICS SELF-MEDICATION AMONG DENTAL PATIENTS FROM LITHUANIAN UNIVERSITY OF HEALTH SCIENCES, MEDICAL ACADEMY FACULTY OF ODONTOLOGY DEPARTMENT OF PROSTHODONTICS

Master's thesis

The thesis was done

by student ...........................................  supervisor ...........................................

                      (signature)                        (signature)

..........................................................  ..........................................................

                        (name surname, year, group)                  (degree, name surname)

........................................... 20....  ........................................... 20....

                      (day/month)                        (day/month)

Kaunas, 2019
# Evaluation Table of Clinical-Experimental Master’s Thesis

**Evaluation:** ...............................................................................................................................................................  

**Reviewer:** ......................................................................................................................................................................  

(Scientific degree, name and surname)  

**Reviewing date:** .........................................................

<table>
<thead>
<tr>
<th>No.</th>
<th>MT parts</th>
<th>MT evaluation aspects</th>
<th>Compliance with MT requirements and evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>Summary (0.5 point)</td>
<td>Is summary informative and in compliance with the thesis content and requirements?</td>
<td>0.3</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Are keywords in compliance with the thesis essence?</td>
<td>0.2</td>
</tr>
<tr>
<td>3</td>
<td>Introduction, aim and tasks (1 point)</td>
<td>Are the novelty, relevance and significance of the work justified in the introduction of the thesis?</td>
<td>0.4</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Are the problem, hypothesis, aim and tasks formed clearly and properly?</td>
<td>0.4</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Are the aim and tasks interrelated?</td>
<td>0.2</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Is the author’s familiarization with the works of other authors sufficient?</td>
<td>0.4</td>
</tr>
<tr>
<td>7</td>
<td>Review of literature (1.5 points)</td>
<td>Have the most relevant researches of the scientists discussed properly and are the most important results and conclusions presented?</td>
<td>0.6</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Is the reviewed scientific literature related enough to the topic analysed in the thesis?</td>
<td>0.2</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Is the author’s ability to analyse and systemize the scientific literature sufficient?</td>
<td>0.3</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>IS the research methodology explained comprehensively? Is it suitable to achieve the set aim?</td>
<td>0.6</td>
</tr>
<tr>
<td>11</td>
<td>Material and</td>
<td>Are the samples and groups of respondents formed and described properly? Were the selection criteria suitable?</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>12</td>
<td>methods</td>
<td>Are other research materials and tools (questionnaires, drugs, reagents, equipment, etc.) described properly?</td>
<td>0.4</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Are the statistical programmes used to analyse data, the formulas and criteria used to assess the level of statistical reliability described properly?</td>
<td>0.4</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>Do the research results answer to the set aim and tasks comprehensively?</td>
<td>0.4</td>
</tr>
<tr>
<td>15</td>
<td>Results</td>
<td>Does presentation of tables and pictures satisfy the requirements?</td>
<td>0.4</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Does information repeat in the tables, picture and text?</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>Is the statistical significance of data indicated?</td>
<td>0.4</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>Has the statistical analysis of data been carried out properly?</td>
<td>0.4</td>
</tr>
<tr>
<td>19</td>
<td>Discussion</td>
<td>Were the received results (their importance, drawbacks) and reliability of received results assessed properly?</td>
<td>0.4</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>Was the relation of the received results with the latest data of other researchers assessed properly?</td>
<td>0.4</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>Does author present the interpretation of results?</td>
<td>0.4</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>Do the data presented in other sections (introduction, review of literature, results) repeat?</td>
<td>0</td>
</tr>
<tr>
<td>23</td>
<td>Conclusions</td>
<td>Do the conclusions reflect the topic, aim and tasks of the Master’s thesis?</td>
<td>0.2</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>Are the conclusions based on the analysed material?</td>
<td>0.2</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>Do they correspond to the research results?</td>
<td>0.2</td>
</tr>
<tr>
<td>26</td>
<td>References</td>
<td>Are the conclusions clear and laconic?</td>
<td>0.1</td>
</tr>
<tr>
<td>27</td>
<td></td>
<td>Is the references list formed according to the requirements?</td>
<td>0.4</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td>Are the links of the references to the text correct? Are the literature sources cited correctly and precisely?</td>
<td>0.2</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>Is the scientific level of references suitable for</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>(1 point)</td>
<td>Master’s thesis?</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------</td>
<td>------------------</td>
<td>---</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>Do the cited sources not older than 10 years old form at least 70% of sources, and the not older than 5 years – at least 40%?</td>
<td>0.2</td>
</tr>
</tbody>
</table>

### Additional sections, which may increase the collected number of points

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Annexes</td>
<td>Do the presented annexes help to understand the analysed topic?</td>
<td>+0.2</td>
<td>+0.1</td>
</tr>
<tr>
<td>31</td>
<td>Practical recommendations</td>
<td>Are the practical recommendations suggested and are they related to the received results?</td>
<td>+0.4</td>
<td>+0.2</td>
</tr>
</tbody>
</table>

### General requirements, non-compliance with which reduce the number of points

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>General requirements</td>
<td>Is the thesis volume sufficient (excluding annexes)?</td>
<td>15-20 pages (-2 points)</td>
<td>&lt;15 pages (-5 points)</td>
</tr>
<tr>
<td>33</td>
<td></td>
<td>Is the thesis volume increased artificially?</td>
<td>-2 points</td>
<td>-1 point</td>
</tr>
<tr>
<td>34</td>
<td></td>
<td>Does the thesis structure satisfy the requirements of Master’s thesis?</td>
<td>-1 point</td>
<td>-2 points</td>
</tr>
<tr>
<td>35</td>
<td></td>
<td>Is the thesis written in correct language, scientifically, logically and laconically?</td>
<td>-0.5 point</td>
<td>-1 points</td>
</tr>
<tr>
<td>36</td>
<td></td>
<td>Are there any grammatical, style or computer literacy-related mistakes?</td>
<td>-2 points</td>
<td>-1 points</td>
</tr>
<tr>
<td>37</td>
<td></td>
<td>Is text consistent, integral, and are the volumes of its structural parts balanced?</td>
<td>-0.2 point</td>
<td>-0.5 points</td>
</tr>
<tr>
<td>38</td>
<td></td>
<td>Amount of plagiarism in the thesis.</td>
<td>&gt;20% (not evaluated)</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td></td>
<td>Is the content (names of sections and subsections and enumeration of pages) in compliance with the thesis structure and aims?</td>
<td>-0.2 point</td>
<td>-0.5 points</td>
</tr>
</tbody>
</table>

<p>|   |          | Are the names of the thesis parts in compliance with the text? Are the titles of sections and sub-sections distinguished logically and correctly? | -0.2 point | -0.5 points |</p>
<table>
<thead>
<tr>
<th></th>
<th>Was the permit of the Bioethical Committee received (if necessary)?</th>
<th>-1 point</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>Are there explanations of the key terms and abbreviations (if needed)?</td>
<td>-0.2 point</td>
</tr>
<tr>
<td>43</td>
<td>Is the quality of the thesis typography (quality of printing, visual aids, binding) good?</td>
<td>-0.2 point</td>
</tr>
</tbody>
</table>

**In total (maximum 10 points):**

**Remark:** the amount of collected points may exceed 10 points.

Reviewer’s comments:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Reviewer’s name and surname ___________________________ Reviewer’s signature __________
# TABLE OF CONTENTS

SUMMARY..................................................................................................................9

ABBREVIATION..........................................................................................................10

INTRODUCTION..........................................................................................................11

REVIEW OF LITERATURE............................................................................................12
  1.1 History and development.......................................................................................12
  1.2 Antibiotics definition............................................................................................12
  1.3 Self-medication definition....................................................................................12
  1.4 Oral conditions....................................................................................................13
  1.5 Prevalence of use................................................................................................13
  1.6 Etiology................................................................................................................13
    1.6.1 Individual’s behavioral patterns........................................................................14
    1.6.2 Paucity of dental and medical services available............................................14
  1.7 Complications....................................................................................................14
  1.8 Recommendations...............................................................................................15

MATERIAL AND METHODS.........................................................................................16
  2.1 Ethical approval...................................................................................................16
  2.2 Validation of translated questionnaire.................................................................16
  2.3 Participants...........................................................................................................16
  2.4 The questionnaire...............................................................................................16-17
    2.4.1 Questions regarding sociodemographic characteristics................................17
    2.4.2 Questions regarding knowledge, attitude and adverse reaction of antibiotics.....17
    2.4.3 Questions regarding behavior related to SMA.................................................17
  2.5 Informed consent................................................................................................18
  2.6 Administration of questionnaire.........................................................................18
  2.7 Data analysis......................................................................................................18

RESULTS....................................................................................................................19-26

DISCUSSION..............................................................................................................27-31

ACKNOWLEDGEMENT..............................................................................................32

CONFLICTS OF INTEREST.........................................................................................32

CONCLUSIONS..........................................................................................................33

PRACTICAL RECOMMENDATIONS..........................................................................34

REFERENCES............................................................................................................35-37
Self-medication with antibiotics (SMA) is a worldwide phenomenon which has presented more negative sides rather than positive. Hence, the aim of this study was to describe, evaluate and investigate the knowledge, behavior and attitude of the participants towards SMA.

Material and methods: 222 questionnaires with structure of 26 questions were given to the outgoing patients from Lithuanian University of Health Sciences (LSMU), Medical Academy (MA), Faculty of Odontology (OF), department of prosthodontics. There were no eligibility criteria besides being an outgoing patient in the duration the study was performed. The questionnaire contained 3 sections which obtained information regarding the sociodemographic status, knowledge, attitude, adverse reactions, behavior and utilization of SMA.

Results: The given questionnaire had 90% response rate, according to this, the results have shown that 54% of the participants had stopped consuming antibiotics after symptoms disappeared. The main opinion regarding SMA was a good practice. Comparison between the genders have shown that men and women have been mostly SMA twice (53.8% versus 47.2%) in the past year. In addition, men have been mostly SMA in case of dental pain 53.3% and women in case of dental pain or fever 35%. Place of residence was also compared, results have shown that the urban group mostly considered the pharmacist 45.3% as the main source of knowledge regarding the required dosage of antibiotics and SMA for less than a week 47.5%, while the rural group addressed to family members or friends and SMA for more than two weeks 22.2%.

Conclusions: Participants irresponsible attitude, behavior and lack of knowledge regarding SMA is supported by the main opinion of which SMA is a good practice, the majority of urban and rural participants who did not consult the right source of knowledge, men and women who did not SMA according to the right indications and more than half of the participants who have stopped SMA after symptoms disappeared.

Keywords: Anti-Bacterial Agents, Self-Medication, Self-Administration, Toothache, Oral Health, Outpatients
ABBREVIATION

SMA - Self-medication with antibiotics

LSMU - Lithuanian University of Health Sciences

MA - Medical Academy

OF - Faculty of Odontology

FIP - international pharmaceutical federation

WHO - World Health Organization

SPSS - statistical Package for the Social Sciences

RCT – root canal treatment
INTRODUCTION

Antibiotics are one of the most acquirable medication in the world [1], this might occur due to the insufficient supervision [2] and the medical practitioners' frequent prescription as the primary way of intervention to influence their patients' health [3]. Antibiotics may quite often be acquired by the public by using an old prescription, by asking friends or family members or even use leftovers from a previous self-medications [2, 4].

Self-medication is defined by the international pharmaceutical federation (FIP) as the utilization of a non-prescribed medication by the consumers on their own enterprise [5]. SMA is a worldwide phenomenon which its prevalence greatly varies between countries and their populations [6].

The knowledge and attitude towards SMA are highly affecting individuals' actions and as a result their health [7]. Because of poor awareness, the public remain uninformed about the possible deadly effects of SMA [8] and the rising global concern regarding the direct impact on their health [9]. Study which was conducted in Lithuania has shown that Lithuanian participants had frivolous attitude and less knowledge concerning antibiotics compared to participants from Sweden, Belgium, Netherlands and Austria [4].

The first hypothesis of this study is that outgoing patients from LSMU, MA, OF, department of prosthodontics are lack of knowledge regarding SMA. The second hypothesis is that those patients present a light-minded behavior and attitude towards SMA. In addition, this study assumes that by investigating and describing participants behavior and attitude it would be easier to understand their actions.

The aim of this study was to describe, evaluate and investigate the knowledge, behavior and attitude of the participants towards SMA.

The objectives of this study were:

1) To describe patients' lack of knowledge.
2) To describe patients' attitude.
3) To describe patients' behavior.
4) To evaluate and investigate the behavior and attitude among patients who SMA.
LITERATURE REVIEW

1.1 History and development

Since the early 20th century, antibiotics have been used to treat microorganisms associated diseases and had led to the significate reduction and control of most of them. Due to antibiotics success, many new types of antibiotics were developed and discovered [10]. The discovery of natural products produced by microorganisms has changed the world of medicine. Life-threatening diseases became controllable with the proper use of antibiotics, eventually leading to a better medicine and an increase of life expectancy [11].

1.2 Antibiotics definition

Antibiotics define as biological compounds that can inhibit or even eliminate microorganism's growth. The term antibiotics was originally based on the word "antibiosis", which describe an opposite interaction between organisms that eventually have led to inhibition or termination of one side [10].

1.3 Self-medication definition

Self-medication is a worldwide phenomenon [12] which define as inappropriate use of medications without prior consultation with a medical practitioner regarding the diagnosis, prescription, duration, doses, treatment and follow up [13]. Patients self-diagnosed certain illness or a medical condition which lead them to the use of medications [1, 14]. According to various literature, self-medication involves an acquired knowledge from local pharmacists, family members, neighbors and media [15].
1.4 Oral conditions

Oral conditions associated with pain and inconvenience requires immediate treatment. Those conditions include infectious diseases such as pericoronitis, apical and periodontal abscesses. Infectious diseases affecting teeth hard tissues, supporting structures and oral mucosa are mostly treated by operative interventions such as restorations, extractions, periodontal therapy or other clinical procedures [16].

The use of antibiotics would be indicated and prescribed in case of specific situations which has led to systemic involvement such as fever, immunosuppression, lymphadenopathy or in case operative intervention is insufficient or contraindicated [16, 17].

1.5 Prevalence of use

Antibiotics had reduced the prevalence of common infectious diseases and became a fundamental part of the treatment [18], eventually became the number one rated drug prescribed by dentists, particularly β-lactamic agents, tetracyclines and macrolides [17].

Although controlled SMA is a fundamental part of proper self-care [13], there is a lack of control by the governments in-charge regarding the distribution of pharmaceutical products and medical consultation prior consumption. This lack of control occurs particularly in developing countries [7, 15], developing economies [9], or even in European countries where the SMA is common [4]. One study from Lithuania has shown that the prevalence of SMA was 22% [4].

The studies which have been done regarding SMA relayed mostly on self-reported surveys. Hence, the true prevalence of SMA is not the same among different countries or populations [19].

1.6 Etiology

There are many factors which have led to the irrational use of SMA [4], those factors may be categorized to individual's behavioral patterns of the participants [9] or to lack of dental and medical services available [15].
1.6.1 Individual's behavioral patterns

SMA is influenced by the participants behavioral patterns [9] such as personal lack of knowledge, sympathy for a sick friend or a family member [12], family approach, patients state of mind as depression or anxiety [20] and the previous experience with prescribed antibiotics [6]. Those behavioral patterns are based on the sociodemographic characteristics of the participants, [9] such as age, gender, education level [20], family income, place of residence [4].

1.6.2 Paucity of dental and medical services available

On a bigger scale, SMA is influenced by the lack of professional clinical assessment [21], growth of self-care and poverty [12], lack of proper supervision, poor dental and medical services available [15], drug manufacturers broad publicity and laws regarding medications distribution and vendition [20].

1.7 Complications

The irresponsible use of antibiotics has led to a great concern among the professional medical community, which is quite aware of the negative side of this consumption. [22].

The absence of clinical evaluation and supervision by the medical practitioners regarding SMA has created few major disadvantages. On the personal level, wrong diagnosis, delayed diagnosis, health risks, wrong use of medication, inadequate treatment, interaction with other medications, adverse reactions, disturbance in the normal bacterial flora [23], drug toxicity and under or over dosing [2, 21, 22, 23]. On a global wider scale, the absence of proper supervision regarding SMA has led to spending of resources, epidemic spread of diseases and develop of pathogen resistance [24].

Those changes have led to loss of treatment efficiency and created the need for a better and more expensive antibiotics in rich countries, while average or poor countries had to face higher incidence of morbidity [18].
1.8 Recommendations

Improper use of antibiotics does not only reflect participants as the blame side, but is also show the medical practitioners' inappropriate prescription [4]. Hence, in order to change the present state of irrational antibiotics usage, World Health Organization (WHO) recommends to educate the public about correct antibiotics usage, to strengthen the health systems and to improve their ability to perform better surveillance [8, 25]. In addition, antibiotics should be given by the medical practitioners according to the right indications, dosage, type of medication, proper time of use and medication of first choice [4].
MATERIAL AND METHODS

A cross sectional survey which was evaluating and investigating the knowledge, behavior and attitude of the participants towards SMA has been conducted at LSMU MA, OF, department of prosthodontics in Kaunas, Lithuania.

2.1 Ethical approval

An abstract of the study survey was prepared and submitted to the head of Bioethics Center dr. E.Peicius, part of the LSMU, later on an ethical approval was given (Nr.DEC-OF-51).

2.2 Validation of translated questionnaire

The survey questionnaire was first prepared in an English form, later on was translated to Lithuanian language (local language) and lastly was retranslated to English in order to check the validity of the translation by back translation method.

2.3 Participants

Out of a total 222 outgoing patients from LSMU MA, OF, department of prosthodontics, which were approached by the researcher, only 200 agreed to participate in the study, a response rate of 90%. The only inclusion criteria needed was to fill the requirement of being an outgoing patient in that department while the study was performed.

2.4 The questionnaire

A specific designed, self-administered questionnaire which includes 26 questions was divided into three sections. The first section, obtained information regarding the sociodemographic data of the survey participants. The second section contained information related to knowledge, attitude and
adverse reaction of antibiotics. The third section contained information related to the behavior of SMA.

2.4.1 Questions regarding sociodemographic characteristics

First section of the questionnaire contained information related to sociodemographic details of the survey participants, such as age, gender, marital status, place of residence and educational Level.

2.4.2 Questions regarding knowledge, attitude and adverse reaction of antibiotics

Second section of the questionnaire contained information related to knowledge, attitude, adverse reaction of antibiotics, such as what do you think about SMA for self-health care, what are antibiotics used for, for which symptoms of common infectious disease antibiotics are mostly used for, how did you know the required dosage of antibiotics, what are the common adverse reactions of antibiotics.

2.4.3 Questions regarding behavior related to SMA

Third section of the questionnaire contained questions which were related to the behavior about SMA, such as have you ever treated yourself with antibiotics, have you ever self-diagnosed condition which lead to the SMA, what was your consideration while selecting specific antibiotics, what were your reasons of SMA, what is the main source from which you usually obtain information regarding SMA, have you ever read the instructions within the antibiotics package, did you understand the instructions, do you always check the expiry date of the before SMA, how many times did you treat yourself with antibiotics in the past year, for how long did you SMA, have you ever had any adverse reaction when you SMA, what would you do in case of adverse reactions, for which of the following dental complaints did you use antibiotics, which antibiotics would you mostly SMA, how many types of different antibiotics did you take maximally during a single illness, when did you stop consuming antibiotics.
2.5 Informed consent

A self-administered questionnaire written in Lithuanian was given to the outgoing patients of the department during January 2019 to March 2019. Participants were informed the questionnaire is anonymous and were included in the survey only after an unwritten informed permission was granted from them.

2.6 Administration of questionnaire

The researcher introduced himself to the survey participants in the local language (Lithuanian) or English, depending on the preferability of the study participants. Confidentiality of the data and anonymity of participation was ensured to all respondents of the study who had the right to withdraw at any stage of data collection. Participants were first interviewed according to the eligibility criteria in order to match the study requirements, then participants were instructed to answer the questions in the questionnaire. They were informed to feel free and raise any questions to clarify their doubts. On average, it took 10–15 minutes for participants to answer all the questions in the questionnaire. The answered questionnaires were received from the participants after they finished answering on the same day.

2.7 Data analysis

Data were processed using MS Excel 2010 and analyzed using IBM SPSS Statistics, version 20. The descriptive analysis included the calculation of the prevalence: categorical data were presented as percentages (%) and frequencies (n). Continuous variable (age) was presented as minimum, maximum, mean and standard deviation. For comparisons age variable was dichotomized into two groups, first group (1) 24–50 years old and second group (2) 51–80 years old. Comparisons were done using the Chi-Square Test and Fisher's exact test. The statistical significance level was set at 95% (p<0.05).
RESULTS

Out of a total 220 given questionnaire, 200 patients agreed to participated in the study. The sociodemographic data are shown in Table 1.

Table 1. The sociodemographic characteristics of the study sample.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 and below</td>
<td>100</td>
<td>50.0</td>
</tr>
<tr>
<td>51 and above</td>
<td>100</td>
<td>50.0</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>120</td>
<td>60.0</td>
</tr>
<tr>
<td>Female</td>
<td>80</td>
<td>40.0</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>121</td>
<td>60.5</td>
</tr>
<tr>
<td>Divorced</td>
<td>27</td>
<td>13.5</td>
</tr>
<tr>
<td>Widowed</td>
<td>15</td>
<td>7.5</td>
</tr>
<tr>
<td>Live with a partner</td>
<td>21</td>
<td>10.5</td>
</tr>
<tr>
<td>Not married</td>
<td>16</td>
<td>8.0</td>
</tr>
<tr>
<td><strong>Place of residence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>128</td>
<td>64.0</td>
</tr>
<tr>
<td>Rural</td>
<td>72</td>
<td>36.0</td>
</tr>
<tr>
<td><strong>Educational level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>60</td>
<td>30.0</td>
</tr>
<tr>
<td>Secondary school</td>
<td>48</td>
<td>24.0</td>
</tr>
<tr>
<td>Professional / Gymnasium</td>
<td>92</td>
<td>46.0</td>
</tr>
<tr>
<td>College</td>
<td>200</td>
<td>30.0</td>
</tr>
<tr>
<td>University</td>
<td>60</td>
<td>24.0</td>
</tr>
</tbody>
</table>

In addition to the data mentioned in Table.1, the mean age was 51.6 with a standard deviation of 15.85.
Fig 1. Participants opinion regarding SMA for self-health care.

Fig 1 has shown that according to most of the respondents, the main opinion about SMA for self-health care was 60% good practice while 20% reported not a good practice, 14% acceptable practice and 6% not an acceptable practice.

Fig 2. Source of knowledge regarding required dosage of antibiotics compared to place of residence.
Fig 2 shows the source of knowledge regarding required dosage of antibiotics compared to place of residence. According to the data analysis, there was a significant association between the two (p=0.020).

For the urban group, the main source of knowledge regarding required dosage of antibiotics was 45.3% by consulting a pharmacist. Rest of the participants answered 18.8% by consulting a family members or friends, 18% from a previous experience, 9.4% by consulting a doctor, 4.7% by searching online and 3.9% by reading the instructions within the package.

Results have shown that the urban group relies more on consulting the pharmacist (45.3% vs 22.2%) as main source of information, while the rural group inclined toward few different sources of information such as consulting family members or friends (29.2% vs 18.8%), based on previous experience (18.1% vs 18%), consulting a doctor (13.9% vs 9.4), by readying the instructions within the package (9.7% vs 3.9) and by searching online (6.9% vs 4.7%).

Fig 3. How many times did you treat yourself with antibiotics in the past year, compared to gender.

Fig 3 shows the amount of times participants treated themselves with antibiotics in the past year, compared to gender.

As visible in Fig 3, the amount of times the male group SMA were twice in the past year 53.8%, followed by once 21.2%, 3 times 15.4% and the least not even once 9.6%.
Results has shown that the male group mostly SMA twice (53.8% vs 47.2%) and 3 times (15.4 vs 2.8) in the past year, while the female group mostly SMA twice (47.2% vs 53.8%), once (30.6% vs 21.2) or not even once (19.4% vs 9.6%).

![Bar graph showing the duration of self-medication among rural and urban residents.](image)

**Fig 4.** For how long did you self-medicated antibiotics, compared to place of residence.

Fig 4 answer the question for how long participants self-medicated antibiotics, compared to place of residence.

As shown in Fig 4, participants from an urban area SMA mostly in a duration of less than a week 47.5%, followed by duration of between 1-2 weeks 45.9% and more than 2 weeks 6.6%.

According the results of illustration 4, the rural group self-medicated antibiotics in a higher percentage in a duration for more than 2 weeks (22.2% vs 6.6%), while for the urban group the most common duration of SMA was less than a week (47.5% vs 40.7%) and between 1-2 weeks (45.9% vs 37%).
Fig 5. When did you stop consuming antibiotics?

According to Fig 5., more than half of the participants stop consuming antibiotics after symptoms disappeared 54%. The other answers had similar percentage, few days after the recovery 14.9%, after consulting a doctor or a pharmacist 11.5%, after a few days regardless of the outcome 10.3% and the least common after antibiotics ran out 9.2%

Fig 6. Symptoms of common infectious disease for which antibiotics was used, compared to gender.
Fig 6 shows the compared data between gender versus symptoms of common infectious disease for which antibiotics was used. According to the data analysis, there was a significate association between the two (p=0.009).

As seen in Fig 6, among the female group, antibiotics are mostly used for fever and equally for dental pain 35%. Results present that due to nausea, antibiotics were used by 21.3% followed by the least of use in case of cough 8.8%.

Results has shown that men use more antibiotics while having dental pain (53.3% vs 35%) and cough (10.8% vs 8.8%), while for women it is more common to use antibiotics in case of fever (35.5% vs 28.3%) and nausea (21.3% vs 7.5%).

Fig 7. For which of the following dental complaints did you use antibiotics, compared with marital status.

Fig 7 shows the dental complaints for which antibiotics were used, compared to marital status. There was a significate association between the two (p=0.002).

Participants from the married group consume antibiotics in case of tooth pain 44.2%, equally for dental abscess and dental sensitivity 23.1%, dental trauma 7.7%, root canal treatment (RCT) 1.9%.

Participants from the divorced group consume antibiotics in case of RCT 43.8%, tooth pain 25%, dental abscess 18.8%, equally for dental trauma and dental sensitivity 6.3%. 
Participants from the widowed group consume antibiotics in case of a tooth pain 75% or dental abscess 25% only.

Participants from the live with a partner group consume antibiotics in case of dental trauma 44.4%, equally for tooth pain and dental sensitivity 22.2%, dental abscess 11.1%.

Participants from the not married group consume antibiotics in case of dental sensitivity 50%, tooth pain 33.3% and dental abscess 16.7%.

When participants were asked for which dental complaints they used antibiotics, the answer were various. Tooth pain was mostly common for widowed group 75%, followed by married group 44.2%, not married group 33.3%. Results have also shown that dental abscess was mostly common for widowed group 25%, followed by married group 23.1%. Dental trauma was mostly common for live with a partner 44.4%. RCT was mostly common for divorced group 43.8%. Dental sensitivity was mostly common for not married group 50%.

![Graph](image_url)

**Fig 8.** What are the common adverse reaction of antibiotics crosstabs with gender.

Fig 8 describes the common adverse reaction of antibiotics, compared to different gender. According to the data analysis, there was a significant association between the two (p=0.011).
According to the results, among the female group the most common adverse reaction of antibiotics was nausea 28.8%, followed by diarrhea 27.5%, rash and vomiting with equal percentage 17.5% and lastly drug resistance 8.8%.

The compared results were higher for the male group in case of diarrhea (33.3% vs 27.5%), vomiting (27% vs 17.5%), drug resistance (12.5% vs 8.8%), While results were higher for the female group in case of nausea (28.8% vs 10%) and rash (17.5% vs 16.7%).

**Fig 9.** What are the common adverse reaction of antibiotics, compared with Age group.

Fig 9 shows the common adverse reaction of antibiotics, compared with different age group. According to the data analysis, there was a significate association between the two (p=0.041).

For the 51-80 years old participants group, the most common adverse reaction of antibiotics was diarrhea 37%. Adverse reaction continues to follow such as nausea 22%, vomiting 21%, rash 13% and drug resistance 7%.

According to the results, for the 24-50 years old participants group, the most common adverse reaction of antibiotics was vomiting (26% vs 21%), rash (21% vs 13%) and drug resistance (15% vs 7%). The other 2 adverse reaction, diarrhea (37% vs 25%) and nausea (22% vs 13%) were higher among the 51-80 years old participants group.
DISCUSSION OF THE RESULTS

This study reviewed the opinions of 200 outgoing patients from LSMU, MA, OF, department of prosthodontics, who had SMA. In the following discussion, the opinions will be compared to other studies and will be divided into few sections.

The sociodemographic data in this study has shown that 50% were males, 50% were females and the mean age was 51.6, while study from Nigeria has shown that the male and female ratio was almost the same with a different mean age of 32.2 [26]. The place of residence was 64% urban and 36% rural, while study from Tamil Nadu, India has shown that rural area was higher with 56% and urban was 44% [2]. Educational level was 46% university, 30% professional or gymnasium, 24% college and in comparison, study from Udaipur, India has shown that participants educational level was lower with 52.7% high school, 33.2% graduates and 14.1% primary school [12]. Marital status was 60.5% married, 13.5% divorced, 10.5% live with a partner, 8% were not married, 7.5% widowed while study from Algarve Region, Portugal has shown that 63% were married, 23.3% not married, 8.4% divorced and 5.2% widowed [6].

The sociodemographic data which was obtained from this study and other studies present a major limitation, due to the fact that the number of participants was very small and did not fully reflect the true values of the population in that area. In the future, this limitation will be solved by expanding the study duration and collecting more information from more participants. The conclusion from the data mention above is the lack of definitive comparison between the results, due to the fact that the sociodemographic data was widely different between each study and could not set a strong foundation for true comparison.

In this study, the most common opinions regarding SMA for self-health care were 60% good practice, followed by 20% not a good practice, 14% acceptable practice and 6% not an acceptable practice. Study from Karachi, Pakistan divided participants opinions before consulting a medical practitioner and after, before consultation the main opinions were acceptable practice 45.8%, not acceptable practice 33.3% and good practice 20.9%, while after consultation there was an important and positive change such as not acceptable practice 47%, acceptable practice 43% and good practice 15.3% [24].

According to the following data, the obvious suggestion is to consult a medical practitioner before SMA which will increase the public awareness. The conclusion from the data mention above is the important value of consultation regarding the usage of SMA, especially due to the fact that the main opinion among the participants is not based on enough of knowledge.
In this study, the source of knowledge regarding the required dosage of antibiotics was compared to place of residence. This study has shown that the urban group mostly consulted the pharmacist 45.3%, family members or friends 18.8%, based on previous experience 18%, searched online 4.7%, read the instructions within the package 3.9%, while the rural group consulted family members or friends 29.2%, pharmacist 22.2%, based on previous experience 18.1%, consulted a doctor 13.9%, read the instructions within the package 9.7% and searched online 6.9%. Study from Nigeria did not compare the data to the place of residence, but has found as well that participants were based on previous experiences 39.7%, consulted health professionals 33.5%, pharmacy staff 14.1% and the least consulted friends or neighbors 12.7% [27].

The main limitation of the other studies was lack of comparison between place of residence and the required dosage of antibiotics as presented in this study. This limitation might be solved in the future if studies will compare their sociodemographic data to other questions in their studies. Although the urban group was comparably more educated then rural group, both of them did not approach the correct source of knowledge regarding the required dosage of antibiotics which has shown the common lack of knowledge among the public. As a result, the suggestion is to increase public knowledge and awareness regarding the appropriate source.

In this study participants were asked about number of times they SMA in the past year while comparing to gender. Results has shown that the male group SMA twice 53.8%, followed by once 21.2%, three times 15.4% and the least not even once 9.6%. The female group mostly SMA twice 47.2%, once 30.6%, not even once 19.4% and three times 15.4%.

Study from Chennai, India has shown that more than half of the participants SMA at least twice in the past year [8], while another study from Kahramanmaraş, Turkey just mentioned that 72.1% of the participants SMA in the past year while 26.9% did not [28].

The first limitation was that the other studies did not compare the gender of the participants and the number of times they were SMA in the past year. The second limitation was that the other studies did not provide enough information about the amount of times their participants SMA in the past year. The conclusion from the data mention above is the participants have presented a frivolity and unfearful behavior regarding SMA. Another conclusion is the fact that other studies did not compare the questions they have presented to the sociodemographic data of the participants as in this study, as a result the comparison to sociodemographic could not be achieved.

In this study participants were asked for how long did they SMA, compared to place of residence. Results has shown that participants from an urban area SMA mostly in a duration of less than a week 47.5%, followed by duration of between 1-2 weeks 45.9% and more than 2 weeks 6.6%. The rural
group mostly SMA for a duration of less than a week 40.7%, between 1-2 weeks 37% and the least for more than 2 weeks 22.2%.

Study from Mumbai, India has shown that participants SMA mostly for the duration of 3 days with 68.7%, 7 days with 23% and the least for 15 days with 8.2% [22]. Study from Udaipur, Rajasthan, India has shown that participants SMA mostly until the condition decreased 38%, some self-medicated for few weeks 34.1% and other just for few days 27.7% [12].

The main limitation was the lack of information regarding the place of residence, which was not compared to the duration of SMA in other studies. In the future, this limitation will be solved by expanding of the studies and comparing to the sociodemographic data. The conclusion from the data mention above is the short duration of SMA by the participants has shown the non-serious behavior and lack of knowledge regarding the correct consumption of antibiotics.

In this study participants were asked when did they stop consuming antibiotics, most of them answered after symptoms disappeared 54%, others answered were days after the recovery 14.9%, after consulting a doctor or a pharmacist 11.5%, after a few days regardless of the outcome 10.3% and the least common after antibiotics ran out 9.2%.

Study from Karachi, Pakistan has shown similar results such as participants stop consuming antibiotics after symptoms disappeared 38.5%, but also provided more responsible answered such as stop consuming antibiotics after end of the duration needed 29.7% and after complete recovery 17.6% [24].

The conclusion from the data mention above is the reasons which have led participants to stopped the consumption of antibiotics reinforced the claim that participants knowledge regarding antibiotics is insufficient.

In this study participants were asked about the symptoms of common infectious disease for which antibiotics were used while comparing to gender. The female group mostly used for fever and equally for dental pain 35%, nausea 21.3% and the least of use in case of cough 8.8%. The male group use more antibiotics in case of tooth pain 53.3%, fever 28.3%, cough 10.8% and nausea 7.5%

Study from Tamil Nadu, India has also shown that participants used antibiotics mostly in case of symptoms such as fever 60%, while also headache 59.6%, cough or cold 51%, toothache 24.7% and the least for sore throat 21% [2].

The main limitation regarding the data mention above was the lack of comparison in other studies between the gender and the symptoms of common infectious disease for which antibiotics was used. As mention previously, this limitation will be solved in the future if other studies will expand their
researches and comparison to the sociodemographic data of their participants. The conclusion from the data mention above is the participants are lack of knowledge regarding the proper indications for the usage of antibiotics.

In this study participants were asked for which dental complaints did they use antibiotics while comparing with marital status. Participants from the married group used antibiotics in case of tooth pain 44.2%, equally for dental abscess and dental sensitivity 23.1%, dental trauma 7.7%, RCT 1.9%. Participants from the divorced group used antibiotics in case of RCT 43.8%, tooth pain 25%, dental abscess 18.8%, equally for dental trauma and dental sensitivity 6.3%. Participants from the widowed group used antibiotics in case of a tooth pain 75% or dental abscess 25% only. Participants from the live with a partner group used antibiotics in case of dental trauma 44.4%, equally for tooth pain and dental sensitivity 22.2%, dental abscess 11.1%. Participants from the not married group used antibiotics in case of dental sensitivity 50%, tooth pain 33.3% and dental abscess 16.7%.

Studies from Saudi Arabia and Nigeria have shown that dental pain was the main complaint for which antibiotics were used, other overlapping complaints were gingivitis, facial swelling and halitosis. Both studies have also shown complaints which did not overlap between them or with this study, such as oral ulcers and teeth mobility [16, 26].

The main limitation regarding the data mention above was the lack of comparison in other studies between the marital status and the dental complaints for which antibiotics was used. The conclusion from the data mention above is the various dental complains which have led to usage of antibiotics have shown that there is a lack of knowledge concerning the justify use of antibiotics, mostly due to poor attitude and light-minded behavior of the participants in case of any dental complain.

In this study participants were asked which common adverse reaction of antibiotics they experienced while comparing with gender. The female group answered that the most common adverse reaction of antibiotics was nausea 28.8%, followed by diarrhea 27.5%, rash and vomiting with equal percentage 17.5% and lastly drug resistance 8.8%. The male group answered that the most common adverse reaction was diarrhea 33.3%, vomiting 27%, drug resistance 12.5%, nausea 10% and the least was rash 16.7%.

Study from Karachi, Pakistan has shown that almost half of the participants were not experiencing adverse reactions, while others had mostly nausea, diarrhea, vomiting and rash as presented in the data mention above [24].

The main limitation of the data in the other study was the lack of comparison between the gender and the common adverse reaction of antibiotics which participants has experienced. The conclusion from
the data mention above is the diversity of answers regarding the common adverse reaction in case of antibiotics usage have supported the claim that participants had adverse reaction due to wrong use which is based on wrong attitude, behavior and knowledge.

In conclusion, the different sections of this discussion have shown the direct connection between participants attitude, knowledge and behavior to their SMA patterns.
ACKNOWLEDGEMENT

I would like to thank my master thesis supervisor Prof. Julija Narbutaitė, from LSMU, MA, OF, head of clinic of oral care and children's dentistry for the constant help and unlimited guidance.

CONFLICTS OF INTEREST

There were no sponsors, suppliers of materials or funds invested. In addition, the author has not encountered any conflict of interests.
CONCLUSIONS

Participants irresponsible attitude, behavior and lack of knowledge regarding SMA is supported by

1. The main opinion of which SMA is a good practice.
2. More than half of the participants have stopped SMA after symptoms disappeared.
3. The majority of urban and rural participants did not consult the right source of knowledge.
4. Men and women did not SMA according to the right indications.
PRACTICAL RECOMMENDATIONS

According to the results and conclusions which were presented in this study, the best way to affect the public lack of knowledge is by broad governmental programs which will explain and educate the public about the meaning of antibiotics and the specific situations or indications which requires SMA or antibiotics usage in general.

In order to affect the public behavior regarding SMA, the governments must increase the supervision and restrict the accessibility which allowed the public to acquire it. In addition, the medical practitioners and the whole medical services must motivate the public and create a change in their attitude.
REFERENCES


ANNEXES

Annex 1: Bioethical approval.

LIETUVOS SVEIKATOS MOKSLŲ UNIVERSITETAS
BIOETIKOS CENTRAS

Kodas 302536989, Tiltas g. 18, LT-47118, Kaunas, tel.: (8 17) 327233, www.lsmu.lt, el. p.: bioetika@lsmu.lt

Medicinos akademijos (MA) 2018-12-17 Nr. BIE-OF-51
Vienitųjų studijų programa – Odontologija
V k. studentui Shahaf Givony
Darbo vadovė prof. Julija Narbutaitė
LSMU KK Burnos priežiūros ir vaikų
odontologijos klinika

DĖL PRITARIMO TYRIMUI

LSMU Bioetikos centras, įvertinęs Shahaf Givony pateiktus dokumentus, studento
tiriamajam darbui tema „Antibiotics self medication among dental patients“ pritaria*.

[Signature]

DR. EIMANTAS PETČIUS

* Pastaba: Šis pritarimas neatliekia tiriamajį mokslinį darbą vykdančių asmenų nuo prievoles laikytis Bendrojo duomenų
apsaugos reglamento nuostatų ir nuo atsakomybės gauti nacionalinio arba regioninio bioetikos komiteto leidimą, jei toks leidimas
būtinas pagal LR Biomedicinių tyrimų etikos įstatymo numatytus reikalavimus.
**Annex 2: The questionnaire in English form.**

My name is Shahaf givony. I am a 5th year student of odontology faculty at LSMU and I am performing a study evaluating the “Antibiotics self-medication among dental patients from LSMU medical academy faculty of odontology department of prosthodontics”. This questionnaire is anonymous and the data will be presented only generalized.

Please answer these questions by putting a mark (X) in the appropriate box for each question.

**Demographic section:**

1. Age: _____________

2. Sex:
   a) Male
   b) Female

3. Marital status:
   a) Married
   b) Divorced
   c) Widowed
   d) Live with a partner
   e) Not married

4. Place of residence:
   a) Urban
   b) Rural

5. Educational Level:
   a) Primary school
   b) Secondary school
   c) Professional / Gymnasium
   d) College
   e) University
   f) Other (please specify) _____________
Knowledge, attitude and adverse reaction section:

6. What do you think about self-medication with antibiotics for self health care?
   a) Good practice
   b) Not a good practice
   c) Acceptable practice
   d) Not acceptable practice

7. What are antibiotics used for? (check more than one if applicable)
   a) Virus infection
   b) Bacterial infection
   c) Other (please specify) _____________

8. For which common infectious disease, symptoms antibiotics are mostly used for?
   a) Dental pain
   b) Fever
   c) Cough
   d) Nausea

9. How did you know the required dosage of antibiotics? (check more than one if applicable)
   a) By reading the instructions within the package
   b) By consulting a doctor
   c) By consulting a pharmacist
   d) By consulting family members / friends
   e) By searching online
   f) From a previous experience
   g) Other (please specify) _____________

10. What is (are) the common adverse reaction(s) of antibiotics? (check more than one if applicable)?
    a) Nausea
    b) Vomiting
    c) Diarrhea
    d) Rash
    e) Drug resistance
self-medication – behavior section:

11. Have you ever treated yourself (self medicated) with antibiotics?
   a) Yes
   b) No

In case you chose No, please do not continue the questionnaire.

12. Have you ever self diagnosed condition which lead to the self medication of antibiotics?
   a) Yes
   b) No

13. What was your consideration while selecting specific antibiotics? (check more than one if applicable)
   a) Type of antibiotics
   b) Price of antibiotics
   c) Indications for use
   d) Adverse reactions
   e) Other (please specify) ______________

14. What was (were) your reason(s) of self medication with antibiotics? (check more than one if applicable)
   a) Cost saving
   b) Convenience
   c) Lack of trust in prescribing doctor
   d) Knowledge about the disease and medication needed
   e) Daily routine and Lack of time
   f) Other (please specify) ______________

15. What is the main source from which you usually obtain information regarding antibiotics for self-medication? (check more than one if applicable)
   a) Pharmacies
   b) Leftover from previous prescription
   c) Friends
   d) Family
e) Online shopping
f) Other (please specify) _____________

16. Have you ever read the instructions within the antibiotics package?
   a) Yes always
   b) Yes sometimes
   c) Never

17. Did you understand the instructions?
   a) Fully understood
   b) partly understood
   c) Did not understand

18. Do you always check the expiry date of the antibiotics before self medication?
   a) Yes
   b) No

19. How many times did you treat yourself with antibiotics in the past year?
   a) 0
   b) 1
   c) 2
   d) 3
   e) 4 and above

20. For how long did you self medicated antibiotics?
   a) Less then a week
   b) Between 1-2 weeks
   c) More then 2 weeks

21. Have you ever had any adverse reaction when you took antibiotics for self-medication?
   a) Yes
   b) No

22. What would you do in case of adverse reactions? (check more than one if applicable)
   a) Stopped taking antibiotics
b) Switched to another antibiotics  
c) Consulted pharmacy staff  
d) Consulted a doctor  
e) Consulted family members/friends  
f) Nothing  
g) Other (please specify) ______________

23. For which of the following dental complaint(s) did you use antibiotics? (check more than one if applicable)  
a) Tooth pain  
b) Dental abscess  
c) Dental trauma  
d) RCT (root canal treatment)  
e) Dental sensitivity

24. Which antibiotics would you mostly self medicated?  
a) Don't remember  
b) I never pay attention to the name  
c) Amoxicillin  
d) Metronidazole  
e) Penicillin G  
f) Clindamycin  
g) Other (please specify) ______________

25. How many types of different antibiotics did you take maximally during a single illness?  
a) 0  
b) 1  
c) 2  
d) 3 and above

26. When did you stop consuming antibiotics? (check more than one if applicable)  
a) A few days after the recovery  
b) After a few days, regardless of the outcome  
c) After symptoms disappeared  
d) After antibiotics ran out
e) After consulting a doctor/pharmacist
f) other (please specify) ______________

Thank you for taking the time to complete this survey! Your responses will contribute to the analyses of the texts and suggest new lines of approach to the corpus data.